DISTRIBUTION SHEET

To Maintenance Services	From Civil/Structural & Environmental Engineering	Page 1 of 1 Date 01/30/95
Project Title/Work Order Load Test of the 306E Building Roof Deck and Support Structure		EDT No. 608365 ECN No. N/A

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
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MAR 17 1995
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ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT 608365

2. To: (Receiving Organization) Maintenance Services		3. From: (Originating Organization) Civil/Structural & Environmental Engineering		4. Related EDT No.: N/A							
5. Proj./Prog./Dept./Div.: Roof inspections		6. Cog. Engr.: R. M. McCoy		7. Purchase Order No.: N/A							
8. Originator Remarks: This reports the results of the load test of the 306E Building roof deck and support structure				9. Equip./Component No.: N/A							
				10. System/Bldg./Facility: 306E							
11. Receiver Remarks:				12. Major Assm. Dwg. No.: N/A							
				13. Permit/Permit Application No.: N/A							
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1	WHC-SD-GN-TRP-30021		0	Load Test of the 306E Building Roof Deck and Support Structure	SQ	1	1				
16. KEY											
Impact Level (F)		Reason for Transmittal (G)			Disposition (H) & (I)						
1, 2, 3, or 4 (see MRP 5.43)		1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)			1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged						
(G)	(H)	17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)						(G)	(H)		
Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
1	1	Cog.Eng. R.M. McCoy	<i>R.M. McCoy</i>	2-1-95	H5-55						
1	1	Cog. Mgr. S.K. Farnworth	<i>S.K. Farnworth</i>	2/1/95	H5-55						
1	1	QA A.K. Sharma	<i>A.K. Sharma</i>	2/23/95	H5-60						
1	1	Safety S. R. Staley	<i>S.R. Staley</i>		B1-33						
		Env.									
18.		19.		20.		21. DOE APPROVAL (if required) Ltr. No. N/A					
R. M. McCoy <i>R.M. McCoy</i> Signature of EDT Originator		K. H. Smith <i>K.H. Smith</i> Authorized Representative for Receiving Organization		S. K. Farnworth <i>S.K. Farnworth</i> Cognizant/Project Engineer's Manager		☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments					
2-1-95		2/1/95		3/6/95							

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Release Date: 3/16/95

**This document was reviewed following the
procedures described in WHC-CM-3-4 and is:**

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

Chris Willingham
C. Willingham

3/16/95

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		8. RELEASE STAMP <div>OFFICIAL RELEASE BY WHC DATE MAR 17 1995 35 Station 21</div>

TEST REPORT

WHC-SD-GN-TRP-30021

Revision 0

LOAD TEST OF THE 306E BUILDING ROOF DECK AND SUPPORT STRUCTURE

For Personnel Access Using
a Remotely Operated Robot

Prepared By: R. M. McCoy Date: 1-16-95
R. M. McCoy, Senior Engineer
Structural Assessments

Reviewed By: R. A. Giller Date: 1-23-95
R. A. Giller, Senior Engineer
Structural Assessments

Approved By: S. K. Farnworth Date: 2/1/95
S. K. Farnworth, Acting Manager
Structural Assessments

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MASTER

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1.0 INTRODUCTION

The 306E Building roof area was load tested according to the approved load-test procedure, WHC-SD-GN-TP-30015, Revision 1. The 306E Building is located in the 300 Area of the Hanford Site and has the following characteristics:

- Roof deck - lightweight concrete
- Roof membrane - tar and gravel
- Roof slope - flat (<10 deg)
- Roof elevation - maximum height of about 7.92 m (26 ft).

The 306E Building was visited in December 1992 for a visual inspection, but insulation board prevented the inspection. The building was revisited in January 1995 for the purpose of writing this test report. Because the roof could not be inspected, a test was determined to be the best way to qualify the roof for personnel access.

2.0 SUMMARY

The 306E Building roof was load tested according to the approved load-test procedure, WHC-SD-GN-TP-30015, Revision 1. The test was performed on January 14, 1995, from 7:30 a.m. to 4:30 p.m.

All pre-test approvals and pre-test checklist items were signed off as shown in Sections 3.3, 3.4, and 3.5 below. On the day of the test, the pre-test briefing was held. The pre-test briefing consisted of filling out the pre-test checklist, discussing proper lifting techniques, reviewing the fall-protection plan, reviewing the job hazards analysis, and reviewing the robot travel path.

The load-test results consist of visual observations and the test engineer's conclusions. Visual observations found no adverse conditions such as large deflections or permanent deformations. No deflection measurements were recorded because the tar and gravel on roofs get displaced by the robot tracks; the result is large variations in deflection measurements.

The conclusions are that the roof has been qualified for 226.8 kg (500 lb) total roof load and that the "No Roof Access" signs can be changed to "Roof Access Restricted" signs as described in section 4.3.

3.0 LOAD TEST

3.1 LOAD-TEST RISKS

Roof load tests involve risks. These risks must be addressed and mitigated by the load-test team and the results accepted or rejected by Safety and the building manager before the test begins. The risks associated with the roof load test fall into two categories: personnel injury and building or equipment damage.

Personnel risks are minimized by evacuating and barricading the work areas, testing the procedure steps, and verifying that the risks are acceptable. Test personnel are also protected by procedures that incorporate job hazards analyses and fall-protection evaluations.

The risks to buildings, building equipment, and the robot are much higher than those for personnel and were evaluated on the basis of the following cost-benefit evaluation based on the 25 buildings to be tested initially.

- Roof access is needed for routine maintenance of roof-mounted equipment, roof membrane repair, and re-roofing work.
- The estimated cost of load testing a roof is \$8,000 per building including the cost of the robot, equipment, and test plan development.
- The estimated cost to move roof-mounted equipment to the ground level is more than \$10,000 per building.
- The estimated cost to remove and replace rigid drywall ceilings so that the roof can be inspected rather than tested is more than \$50,000 per building.
- If a robot falls through the roof, the financial losses are the cost of the robot @ \$50,000 and the repair of building equipment @ \$10,000. [Note: Damage to the building is not included because the roof would have to be repaired anyway.]

Possible damage to building, equipment, and robot is a cost-only risk that is mitigated as follows.

- Visual inspections shall be performed to look for deterioration and test feasibility.
- Expensive equipment is removed from the test areas and the areas beneath.
- The roof is evaluated structurally to verify that, as designed, it is adequate to support the robot.
- Testing of roofs that perform poorly, such as pre-cast concrete or gypsum materials, or structurally suspect roofs will be avoided. Testing of these roofs shall be contingent on further cost-benefit analyses.

- Test failures are expected to be localized, e.g., one wheel of the robot punches through the roof membrane. During the test, deflections are monitored so that if a local failure occurs the test can be stopped before the whole robot falls through the roof.
- Thought was given to tethering the robot to anchor points or overhead cranes. However, it would cost an estimated \$10,000 per building (for a total of \$250,000) to secure the \$50,000 robot. Additionally, the sudden snap of the securing cable system or crane boom movement would be more dangerous to the robot operators than letting the robot free fall.
- The roof deck on 306E is supported by steel bulb tees on 812.8 mm (32 in) centers. If a section of decking is deteriorated, failure will be localized and the tracks on the robot will prevent it from completely falling through the deck.

3.2 TEST PROCEDURE

- The test engineer was designated as R. M. McCoy.
- The 306E Building roof area was visited for inspection in December 1992; an inspection of the roof could not be performed because of insulation board.
- Deflection calculations (Appendix A) indicate a maximum deflection at the point of greatest deflection of 5.59 mm (0.22 in) for 481.72 kg (1,062 lb).
- The building plan provided in Appendix B indicates the test area, the observation area, the route that the robot will take to get to and from the roof, and the route the robot will take to test the roof.
- The test engineer has prepared this test report and obtained the pre-test approvals indicated in Section 3.3.
- The job hazards analysis appears in Appendix C.
- A fall-protection program appears in Appendix D.
- Pre-job briefing minutes appear in Appendix E.
- The 306E Building is an office building and houses personnel on a full-time basis. The interior of the building shall be barricaded off with "CAUTION" tape and posted with "DANGER" signs.
- The area around the exterior of the building where the load test is being performed shall be barricaded off at ground level with "CAUTION" tape, and all doors leading into the test area shall be posted with "DANGER" signs.
- Observation ladders and platforms are required for this load test.
- The qualified robot operator for this test shall be R. M. McCoy.

- The robot is to be placed on the roof with the use of the scissors lift.
- The robot shall move across the roof following the path specified on the building plan in Appendix B. The first pass shall be made with an unloaded robot (272.16 kg [600 lb]). The second pass shall be made with the fully loaded robot (481.72 kg [1,062 lb]). Note: The fully loaded robot weighs 481.72 kg (1,062 lb); that weight divided by the robot footprint yields a uniform load under the robot of 4,309 Pa (90 lb/ft²).
- The test engineer shall observe the movement of the robot and look for abnormally large or permanent deflections. The test engineer shall base the pass/fail determination on these observed deflections. [Note: This pass/fail determination deviates from the approved test procedure.] Failed roof deck and support members shall be considered unsafe to walk on or under, and appropriate safety measures shall be taken by the building manager.
- The robot shall be removed from the roof after this test with the use of a scissors lift.
- The test engineer or building manager shall remove the load-test postings following the test.
- The building manager shall post the building as unsafe, as required, on the basis of the results of the load testing or at the recommendation of Industrial Safety.
- The test engineer shall complete this test report.

3.3 PRE-TEST APPROVALS, RELEASE TO PROCEED

Your signature on this form signifies your agreement with this roof deck load-test plan, and with the pre-test checklist items. The load test may proceed anytime within three months of signing this form.

R. M. McCoy/ R.M. McCoy Date: 1-11-95
Test Engineer (Printed/Signature)

S. K. Farnworth/ SK Farnworth Date: 1/11/95
Engineering Management (Printed/Signature)

S. R. Staley/ SR Staley Date: 1/12/95
Industrial Safety (Printed/Signature)

A. K. Sharma/ Ak Sharma Date: 1/13/95
Quality Assurance (Printed/Signature)

W. H. Hays/ WH Hays Date: 1/12/95
Building Manager (Printed/Signature) for WH Hays

3.4 TEST ENGINEER'S QUALIFICATION

- Degree or equivalent work experience in structural, civil, or mechanical engineering fields.
- Two years of combined field and analysis experience in the design, evaluation and construction of building structures.
- Experience in the construction materials of the building being tested, e.g., steel concrete, or wood.
- Approval of the engineering manager shall testify to the ability and credentials of the test engineer.

R. M. McCoy/ R.M. McCoy Date: 1-11-95
Test Engineer (Printed/Signature)

S. K. Farnworth/ SK Farnworth Date: 1/11/95
Acting Manager (Printed/Signature)

3.5 PRE-TEST CHECKLIST

STEP	SIGNATURE	DATE
BEFORE THE LOAD TEST IS SCHEDULED:		
Verify that an attempt was made to inspect the roof visually, to find deficiencies and to determine the feasibility of making a load test.	R.M. Muly	Aushame 1-11-95
Verify that the roof needs to be load tested.	R.M. Muly	Aushame 1-11-95
Determine slope of roof $\leq 25^\circ$.	R.M. Muly	Aushame 1-11-95
Prepare building roof plan.	R.M. Muly	Aushame 1-11-95
Prepare stress and deflection calculations based on the as-built member strengths.	R.M. Muly	Aushame 1-11-95
Prepare job hazards analysis.	R.M. Muly	Aushame 1-11-95
Prepare fall-protection plan.	R.M. Muly	Aushame 1-11-95
Obtain pre-test approvals.	R.M. Muly	Aushame 1-12-95
Schedule test date.	R.M. Muly	Aushame 1-12-95
Notify Industrial Safety of test date.	R.M. Muly	Aushame 1-12-95
Notify QA of test date.	R.M. Muly	Aushame 1-12-95
DAY BEFORE TEST:		
Check robot batteries for full charge.	R.M. Muly	1-13-95
Hold pre-job briefing. (May be conducted on the day of the test.)	R.M. Muly	Aushame 1-14-95
ON THE TEST DAY:		
Verify that personnel and valuable/critical equipment have been removed from the building below the load-test area.	R.M. Muly	Aushame 1-14-95
Barricade off and post danger signs in the load-test area.	R.M. Muly	Aushame 1-14-95
De-energize or shut down equipment or switchgears that are installed under or on the roof test area	N/A	
Place observation ladders or platforms.	N/A	N/A

4.0 RESULTS AND RECOMMENDATIONS

4.1 LOAD-TEST DATA

The load-test data consist of the following visual observations by the test crew.

- Turning of the robot resulted in the gravel on the roof being moved.
- The tar roof membrane under the gravel layer was not damaged.
- No large deflection or permanent deformation of the deck was noted.

4.2 QUALIFICATION RESULTS

The loads for this test were 272.16 kg (600 lb) for the unloaded robot and 481.72 kg (1,062 lb) for the fully loaded robot. With these loads no large deflections or permanent deformations were noted. Visual observations reported no soft or weak spots in the roof deck.

On the basis of these observations, the roof deck is qualified for limited personnel access. Personnel and equipment should be limited to half of the tested load or about 226.8 kg (500 lb) on a 1.22- by 1.22-m (4- by 4-ft) area.

4.3 RECOMMENDATIONS

The roof is qualified for 226.8 kg (500 lb) of personnel and equipment in each roof area. The "No Roof Access" signs can be changed to one of the following:

- "Roof Access Restricted. See Building Manager for Access."
- "Roof Load Restricted to 226.8 kg (500 lb) Total."

The roof deck should be load tested at 3-year intervals. This interval is recommended as the maximum inspection interval on the basis of the present condition of the roof. It assumes that the roof is maintained to prevent deterioration from both interior and exterior sources (e.g., roof or steam leaks). The recommended interval should be shortened, should the possibility of deterioration occur (e.g. roof leaks). If the roof is to have regular foot traffic, the load test-interval should be reduced to half of the suggested interval.

5.0 REFERENCES

WHC, 1994, *Procedure for the Load Testing of Roof Decks and Support Structures*, WHC-SD-GN-TP-30015, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

APPENDIX A
STRESS/DEFLECTION CALCULATIONS

ANALYTICAL CALCULATIONS

Page 1 of

Subject 306E ROOF

Originator R.M. MCCOY

Date 1-9-95

Checker RA. Miller

Date 1-11-95

CHECK 306E ROOF FOR THE ROOF LOAD TEST ROBOT (1062#)

$L_{max} = 8'$
ASSUME: * ONE SPAN

* LOAD IS DISTRIBUTED UNIFORMLY TO THE
* CONTACT POINTS (265.5#) & ACTS OVER 3' WIDTH
(REF H-3-12777)

$P = 265.5 \#$

DL

CONCRETE $\frac{2}{12}(36) \approx 6 \text{ PSF}$
BUILT-UP ROOF $\approx 6 \text{ PSF}$ (ASSUMED 5 PLY)
INSULATION 1" RIB ID $\approx 1.5 \text{ PSF}$
13.5 PSF

AISC 9TH PL-310

$\therefore W \approx 13.5(3) = 40.5 \text{ PLF}$

$$M_{max} = \frac{P}{2L} \left(L - \frac{a}{2} \right)^2 + \frac{wL^2}{8}$$

$$= \frac{265.5}{2(8)} \left(8 - \frac{2}{2} \right)^2 + \frac{40.5(8)^2}{8}$$

$\approx 1137 \text{ ft-lb}$

REF. CVI FILE 11552

ANALYTICAL CALCULATIONS

Page 2 of

Subject 306E ROOF

Originator R.M. McCay

Date 1-9-95

Checker R.A. Miller

Date 1-11-95

$$f'_c = 500 \text{ PSI}$$

$$f_y = 36 \text{ KSI (ASSUMED)}$$

$$w_c = 35 \text{ PCF}$$

$$E_c = w_c^{1.5} 33 \sqrt{f'_c} \quad (\text{ASSUMED})$$

$$= (35)^{1.5} (33) \sqrt{500}$$

$$\approx 152792 \text{ PSI}$$

$$E_s = 29000000 \text{ PSI}$$

$$n = \frac{E_s}{E_c} = \frac{29000000}{152792} \approx 190$$

$$A_s \approx 2.156 (.406) \approx .87 \text{ in}^2$$

$$A = 36(2) + (190-1) .87 \approx 236 \text{ in}^2$$

$$\bar{y} = \frac{36(2)(1) + 189(.87)(3.203)}{236} \approx 2.54"$$

$$I = \left[36(2) \frac{1^3}{12} + 36(2)(2.54-1)^2 \right] + (189)(.87) \underbrace{(3.203-2.54)^2}_{.663} \approx 267 \text{ in}^4$$

$$f_s = n \frac{M_c}{I} = 190 \frac{(1137)(12)(.663)}{267} \approx 6437 \text{ PSI} \leq .6 F_y = 21.6 \text{ KSI} \quad \underline{\text{OK}}$$

$$f_c = \frac{M_c}{I} = \frac{1137(12)(2.54)}{267} \approx 130 \text{ PSI} < .45 f'_c = .45(500) = 225 \text{ PSI} \quad \underline{\text{OK}} \\ \text{COMPRESSION} \quad (\text{ACI A.3.1a})$$

$$\text{DEFLECTION } a = [8-2]/2 = 3' \quad L = 8'$$

$$\Delta_{MAX,LL} = \frac{P_L}{24EI} (3L^2 - 4a^2)$$

$$= \frac{265.5(36)}{24(152792)(267)} [3(96)^2 - 4(36)^2]$$

$$\approx .22"$$

APPENDIX B
BUILDING PLAN

306 W ← → 306 E

306E BUILDING PLAN
(LOADED & UNLOADED)

APPENDIX C
JOB HAZARDS ANALYSIS

HANFORD JOB HAZARD ANALYSIS CHECKLIST

Page 1 of 2

Prepared By R. M. McCoy

Date 01/11/95

Area 300

Bldg. 306E

Scope/Description: Roof load test of the 306E Building using a remotely operated robot

☒ New

☐ Revised

Emergency Contact Person(s):

Primary:

Secondary:

Emergency Radio/Phone Number: MOBIL 811

JHA Number (not required):

Specific Work Location(s): 306E Building Roof

KNOWN OR POTENTIAL HAZARDS

	Yes	No	✓	•	Reference		Yes	No	✓	•	Reference
1. Radiation Area Work		X	✓	•		10. Respiratory Hazards		X	✓	•	
2. Hazardous Waste Operations		X	✓	•		11. Electrical Hazards		X	✓	•	
3. Confined Space Entry		X	✓	•		12. Lock and Tag		X	✓	•	
4. Cutting/Welding		X		•		13. Scaffolding		X			
5. Roof Work	X				See page 2	14. Aerial Lifts	X		✓		See page 2
6. Fall Hazards (> = 10')	X				See page 2	15. Asbestos Removal		X	✓	•	
7. Excavation/Trenching		X		•		16. Other (see JHA Sht. 2):		X			
8. Asbestos Inspection Report		X		•		✓ = Formal training required.					
9. Hazardous Materials		X	✓			• = Items than require a permit/form/report.					

Other Hazards	Yes	No	Control Measures
1. Temperature Extremes	X		During cold weather, insulated coverall will be worn
2. Noise		X	
3. Poor Lighting		X	
4. Animals/Insects		X	
5. Process Chemicals/Steam		X	
6. Dust		X	
7. Flammable/Combustible Materials		X	
8. Ladders		X	
9. Wet/Slippery Floors		X	
10. Uneven Terrain		X	
11. Open Excavations/Trenches	X		No roof access in untested areas
12. Adjacent Water Hazard		X	
13. Vehicle Traffic	X		Baracade off work area and post
14. Heavy Equipment		X	
15. Rigging Operation		X	
16. Manual Lifting	X		Manual lifting of weights, see page 2 for control measures
17. Power Tools	X		Robot will be operated by trained and qualified operators
18. Pinch Points	X		See page 2 for control measures
19. Falling Objects	X		Baracade off work area and post area as no access.
20. Sharp Objects		X	
21. Overhead Obstructions		X	
22. Site Control (Signs/Barricades)	X		"CAUTION" tape & "DANGER" sign will be used to baracade area
23. Remote Work Area		X	
24. Other (see JHA Sht. 2):		X	

MINIMUM DRESS REQUIREMENTS: Dress for outside work / safety shoes / hard hat / safety glasses

APPROVALS

Does further evaluation of the job steps, associated hazards, or safety measures need to be performed?

☐ Yes

☐ No

If Yes, continue job hazard analysis on the following pages.

Supervisor, Person in Charge R. M. McCoy

(Signature)

R. M. McCoy

Industrial Safety/Hygiene

(Signature)

S. R. Staley

S. R. Staley

HANFORD JOB HAZARD ANALYSIS CHECKLIST

Roof Work	Load testing the roof deck and supporting structure will be performed from the roof top.
Fall Hazard	The fall hazard associated with this task is a property-damage risk and a personnel hazard. See fall-protection program.
Aerial Lift	The operator of the scissor lift (leased) will have formal training on aerial lifts and review with the supplier of the scissor lift the operations of the scissor lift.
Manual Lifting	<p>Lifting of the robot weights has the potential for back injury.</p> <p>Correct lifting methods shall be used, and the robot operators who will be doing the lifting have been trained in these methods during group safety meetings.</p> <p>Weights shall be lifted onto the robot only on areas of the roof that have already been qualified by visual inspection.</p>
Pinch Points	The operation of the robot produces pinch points. During the operation of the robot, all personnel shall maintain a minimum distance of 10 ft except for the operators of the robot. The operators shall maintain a distance of 2 ft from the pinch point areas during the robot operations.

APPENDIX D
FALL-PROTECTION PROGRAM

FALL-PROTECTION PROGRAM

PART A: SCISSORS LIFT

A scissors lift will be used to place the robot on and off the roof. When the robot is moved between the scissors lift and the roof, one section of the handrail will be removed. The scissors lift can also be used as an observation platform.

Fall protection will be required. A full body harness with an 8-ft lanyard attached to an approved anchor point on the scissors lift will be used.

Personnel requiring the use of fall-arrest equipment shall be trained and instructed in its use.

PART B: ROBOT ROOF ACCESS

The fall hazard associated with the robot is loss of property only.

To restrict access to the area under the roof that is being load tested, the following precautions will be used where applicable.

- Lock doors into the test area and post with "DANGER" signs.
- Barricade off the area using "CAUTION" tape and post with "DANGER" signs.

PART C: PERSONNEL ROOF ACCESS

Personnel and the robot shall be separated by a minimum of one column line, except when the robot is located directly over the ridge beam. The ridge beam is the only place on the roof where the robot, the weights, and test personnel are permitted to be in the same roof area at the same time.

Personnel are to maintain a minimum distance of 6 ft from the edge of the roof. If personnel are required to be within 6 ft of the edge, then an approved fall-arrest system will be used.

APPENDIX E
PRE-JOB BRIEFING MINUTES

Pre-Job Briefing Minutes

Date: 1-14-95
Building: 306E BUILDING
Attendance: R. M. McCoy, R. A. Giller, S. K. Farnworth

The pre-job briefing meeting was attended by Central Engineering and Projects. The meeting covered the procedure to load-test the 306E Building.

The following topics were reviewed:

- Risk associated with the load test
- The building plan
- The job hazards analysis
- The fall-protection program
- Safety barricading requirements.

Any additional personnel who come onto the test site must read the 306E Building test report (WHC-SD-GN-TRP-30021) and review the above topics.

WORK RELEASE FOR CONSTRUCTION/SERVICE ORGANIZATIONS

1. Date	2. Shift	3. Bldg/Area	4. Contractor/Service Org. Point of Contact	5. Phone No.	6. Job No.
01/12/95	day	306E	R. M. McCoy/8D440	376-0411	

7. Job Description

Preform roof load test of the 306E Building on 1/14/95 between 7:00 am and 5:00 pm.

8. Support Required (Operator, HPT, others)

None

9. Special Requirements (Health, Safety, etc.) for Work Release by Facility Release Authority

X-ray machine to be turn off and key removed on friday 1/13/95 at end of shift.

10. Lockout No.	11. Facility Release Authority (print)	12. Signature	13. Time	14. Date
N/A	KH Smith		1/12/94	930AM

15. End of Shift Status, including work complete and cleanup (provide to Release Authority prior to shift change)

On monday 1/16/95, normal operations can continue

16. Lockout Removed	17. Facility Owner/Operations End of Shift
☐ Yes ☐ No ☒ N/A	